

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Previously Presented) A system comprising:
a communication network; and
a food product manager in communication with a monitored location through said communication network, wherein said manager receives product-temperature condition information from said monitored location and determines a food product index for a refrigerated product as a function of a frequency and severity of said product-temperature condition information.

2. (Original) The system of Claim 1, wherein said product-temperature condition is cyclical.

3. (Original) The system of Claim 1, wherein said function is a time-temperature calculation.

4. (Original) The system of Claim 3, wherein said time-temperature calculation includes time and temperature set points combined to provide an alarming point.

5. (Original) The system of Claim 1, wherein said function is a degree-minute calculation.

6. (Original) The system of Claim 5, wherein said degree-minute calculation integrates an ideal product temperature curve with respect to time.

7. (Original) The system of Claim 1, wherein said function is a bacteria-count calculation.

8. (Original) The system of Claim 7, wherein said bacteria-count calculation periodically calculates a bacteria count for a given temperature at a given time.

9. (Original) The system of Claim 8, wherein said periodic calculation produces the bacteria-count curve.

10. (Original) The system of Claim 7, wherein said bacteria-count calculation is a function of a base bacteria count, time, product type, and temperature.

11. (Original) The system of Claim 7, wherein said bacteria-count calculation includes separately counting both spoiler bacteria and pathogen bacteria.

12. (Original) The system of Claim 11, wherein said manager generates a food quality alarm when said spoiler bacteria reaches a predetermined level.

13. (Original) The system of Claim 11, wherein said manager generates a food safety alarm when said pathogen bacteria reaches a predetermined level.

14. (Original) The system of Claim 7, wherein said manager generates a food quality index calculation to monitor the quality of said refrigerated product.

15. (Original) The system of Claim 14, wherein said food quality index includes:

measuring a temperature of said refrigerated product;
determining an average temperature as a function of said temperature;
determining an average shelf-life rating for said refrigerated product;
determining an average ideal storage temperature for said refrigerated product;
determining an average base bacteria count as a function of product type;
determining a bacteria count as a function of said average temperature, said average shelf-life rating and said average base bacteria count;
determining a quality factor as a function of said bacteria count and said average base bacteria count; and
determining an average quality factor.

16. (Original) The system of Claim 7, wherein said manager generates a food safety index calculation to provide evaluation of food safety risk.

17. (Original) The system of Claim 16, wherein said food safety index includes:

measuring a temperature of said refrigerated product;
determining a maximum temperature as a function of said temperature;
determining a maximum shelf-life rating for said refrigerated product;
determining a maximum base bacteria count as a function of product type;
determining a bacteria count as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count;
determining a safety factor as a function of said bacteria count and said maximum base bacteria count; and
determining an average safety factor.

18. (Previously Presented) A method comprising:

transferring product-temperature condition information from a refrigerated location to a management center; and
outputting a food product index at said management center for a refrigerated product as a function of said frequency and severity of said product-temperature condition.

19. (Previously Presented) The method of Claim 18, wherein said food product index is a food safety index determined by:

measuring a temperature of each of a plurality of product types within a plurality of refrigeration cases;

determining a maximum temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining a maximum shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining a maximum base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count;

determining a safety factor as a function of said bacteria count and said base bacteria count for each of said refrigeration cases; and

determining an average safety factor for said plurality of refrigeration cases.

20. (Previously Presented) The method of Claim 18, wherein said food product index is a food quality index determined by:

measuring a temperature of each of a plurality of product types within a plurality of refrigeration cases;

determining an average temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining an average shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining an average ideal storage temperature for each of said plurality of refrigeration cases;

determining an average base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said average temperature, said average shelf-life rating and said average base bacteria count;

determining a quality factor as a function of said bacteria count and said average base bacteria count for each of said refrigeration cases; and

determining an average quality factor for said plurality of refrigeration cases.

21. (Original) The method of Claim 18, further comprising initiating an alarm if said food product index exceeds a predetermined level.

22. (Original) The method of Claim 21, wherein said alarm is initiated at either of said management center and the remote location.

23. (Currently Amended) A system comprising a processing center in communication with a refrigeration system through a communication network, wherein said processing center receives product-temperature information from said refrigeration system for determining a food product index as a function of a frequency and severity of said product-temperature information for a plurality of product types within a plurality of refrigeration cases.

24. (Original) The system of Claim 23, wherein said food product index is a food safety index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining a maximum temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining a maximum shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining a maximum base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count;

determining a safety factor as a function of said bacteria count and said base bacteria count for each of said refrigeration cases; and

determining an average safety factor for said plurality of refrigeration cases.

25. (Original) The system of Claim 23, wherein said food product index is a food quality index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining an average temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining an average shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining an average ideal storage temperature for each of said plurality of refrigeration cases;

determining an average base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said average temperature, said average shelf-life rating and said average base bacteria count;

determining a quality factor as a function of said bacteria count and said average base bacteria count for each of said refrigeration cases; and

determining an average quality factor for said plurality of refrigeration cases.

26. (Original) The system of Claim 23, further comprising initiating an alarm if said food product index exceeds a predetermined level.

27. (Original) The system of Claim 26, wherein said alarm is initiated at either of said management center and the remote location.

28. (Currently Amended) A method of monitoring and managing a refrigeration system at a retail location, comprising:

transmitting information from a refrigeration system at a retail location to a processing center at a remote location; and

determining a food product index as a function of a frequency and severity of said product-temperature information at said processing center for a plurality of product types within a plurality of refrigeration cases of said refrigeration system.

29. (Original) The method of Claim 28, wherein said food product index is a food safety index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining a maximum temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining a maximum shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining a maximum base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count;

determining a safety factor as a function of said bacteria count and said base bacteria count for each of said refrigeration cases; and

determining an average safety factor for said plurality of refrigeration cases.

30. (Original) The method of Claim 28, wherein said food product index is a food quality index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining an average temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining an average shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining an average ideal storage temperature for each of said plurality of refrigeration cases;

determining an average base bacteria count for said plurality of refrigeration cases as a function of product type;

determining a bacteria count for each of said refrigeration cases as a function of said average temperature, said average shelf-life rating and said average base bacteria count;

determining a quality factor as a function of said bacteria count and said average base bacteria count for each of said refrigeration cases; and

determining an average quality factor for said plurality of refrigeration cases.

31. (Original) The method of Claim 28, further comprising initiating an alarm if said food product index exceeds a predetermined level.

32. (Original) The method of Claim 31, wherein said alarm is initiated at either of said management center and the remote location.

33. (New) A food product manager in communication with a monitored location through said communication network, wherein said manager receives product-temperature condition information from said monitored location and determines a food product index for a refrigerated product as a function of a frequency and severity of said product-temperature condition information.

34. (New) The manager of Claim 33, wherein said product-temperature condition is cyclical.

35. (New) The manager of Claim 33, wherein said function is a time-temperature calculation.

36. (New) The manager of Claim 35, wherein said time-temperature calculation includes time and temperature set points combined to provide an alarming point.

37. (New) The manager of Claim 33, wherein said function is a degree-minute calculation.

38. (New) The manager of Claim 37, wherein said degree-minute calculation integrates an ideal product temperature curve with respect to time.

39. (New) The manager of Claim 33, wherein said function is a bacteria-count calculation.

40. (New) The manager of Claim 39, wherein said bacteria-count calculation periodically calculates a bacteria count for a given temperature at a given time.

41. (New) The manager of Claim 40, wherein said periodic calculation produces the bacteria-count curve.

42. (New) The manager of Claim 39, wherein said bacteria-count calculation is a function of a base bacteria count, time, product type, and temperature.

43. (New) The manager of Claim 39, wherein said bacteria-count calculation includes separately counting both spoiler bacteria and pathogen bacteria.

44. (New) The manager of Claim 43, wherein said manager generates a food quality alarm when said spoiler bacteria reaches a predetermined level.

45. (New) The manager of Claim 43, wherein said manager generates a food safety alarm when said pathogen bacteria reaches a predetermined level.

46. (New) The manager of Claim 39, wherein said food product index is a food quality index calculated to monitor the quality of said refrigerated product.

47. (New) The manager of Claim 46, wherein said food quality index includes:
measuring a temperature of said refrigerated product;
determining an average temperature as a function of said temperature;
determining an average shelf-life rating for said refrigerated product;
determining an average ideal storage temperature for said refrigerated product;
determining an average base bacteria count as a function of product type; and
determining a bacteria count as a function of said average temperature, said
average shelf-life rating and said average base bacteria count.

48. (New) The manager of Claim 47, further comprising:
determining a quality factor as a function of said bacteria count and said average
base bacteria count; and
determining an average quality factor.

49. (New) The manager of Claim 39, wherein said food product index is a
food safety index calculated to evaluate food safety risk.

50. (New) The manager of Claim 49, wherein said food safety index includes:
measuring a temperature of said refrigerated product;
determining a maximum temperature as a function of said temperature;
determining a maximum shelf-life rating for said refrigerated product;
determining a maximum base bacteria count as a function of product type; and

determining a bacteria count as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count.

51. (New) The manager of Claim 50, further comprising:

determining a safety factor as a function of said bacteria count and said maximum base bacteria count; and

determining an average safety factor.

52. (New) A system comprising a processing center in communication with a refrigeration system through a communication network, wherein said processing center receives information from said refrigeration system for determining a food product index for a plurality of product types within a plurality of refrigeration cases, wherein said food product index is a food safety index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining a maximum temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining a maximum shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining a maximum base bacteria count for said plurality of refrigeration cases as a function of product type; and

determining a bacteria count for each of said refrigeration cases as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count.

53. (New) The system of Claim 52, further comprising:
determining a safety factor as a function of said bacteria count and said base bacteria count for each of said refrigeration cases; and
determining an average safety factor for said plurality of refrigeration cases.

54. (New) A system comprising a processing center in communication with a refrigeration system through a communication network, wherein said processing center receives information from said refrigeration system for determining a food product index for a plurality of product types within a plurality of refrigeration cases, wherein said food product index is a food quality index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining an average temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining an average shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining an average ideal storage temperature for each of said plurality of refrigeration cases;

determining an average base bacteria count for said plurality of refrigeration cases as a function of product type; and

determining a bacteria count for each of said refrigeration cases as a function of said average temperature, said average shelf-life rating and said average base bacteria count.

55. (New) The system of Claim 54, further comprising:

determining a quality factor as a function of said bacteria count and said average base bacteria count for each of said refrigeration cases; and

determining an average quality factor for said plurality of refrigeration cases.

56. (New) A method of monitoring and managing a refrigeration system, comprising:

transmitting information from a refrigeration system at a retail location to a processing center at a remote location; and

determining a food product index at said processing center for a plurality of product types within a plurality of refrigeration cases of said refrigeration system, wherein said food product index is a food safety index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining a maximum temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining a maximum shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining a maximum base bacteria count for said plurality of refrigeration cases as a function of product type; and

determining a bacteria count for each of said refrigeration cases as a function of said maximum temperature, said maximum shelf-life rating and said maximum base bacteria count.

57. (New) The method of Claim 56, further comprising:

determining a safety factor as a function of said bacteria count and said base bacteria count for each of said refrigeration cases; and

determining an average safety factor for said plurality of refrigeration cases.

58. (New) A method of monitoring and managing a refrigeration system, comprising:

transmitting information from a refrigeration system at a retail location to a processing center at a remote location; and

determining a food product index at said processing center for a plurality of product types within a plurality of refrigeration cases of said refrigeration system, wherein said food product index is a food quality index determined by:

measuring a temperature of each of said plurality of product types within said plurality of refrigeration cases;

determining an average temperature for each of said plurality of refrigeration cases as a function of said temperature;

determining an average shelf-life rating for each of said plurality of refrigeration cases as a function of product type;

determining an average ideal storage temperature for each of said plurality of refrigeration cases;

determining an average base bacteria count for said plurality of refrigeration cases as a function of product type; and

determining a bacteria count for each of said refrigeration cases as a function of said average temperature, said average shelf-life rating and said average base bacteria count.

59. The method of Claim 58, further comprising:

determining a quality factor as a function of said bacteria count and said average base bacteria count for each of said refrigeration cases; and

determining an average quality factor for said plurality of refrigeration cases.